April 13, 1937. T. A. O'LEARY 2,077,054

GAS MASK EQUIPMENT

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Fig. 1.

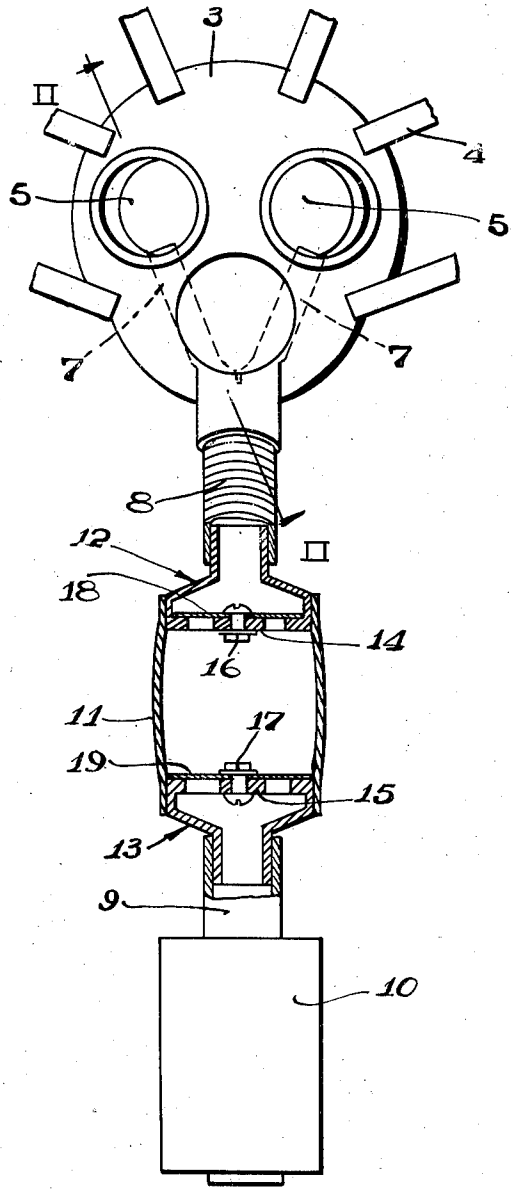
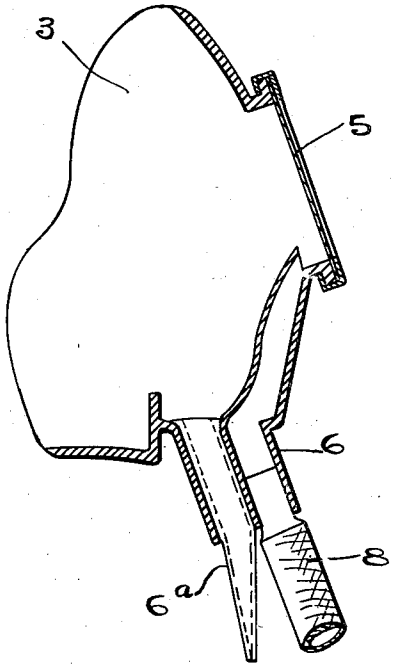


Fig. 2.



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GAS MASK EQUIPMENT

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2 Claims. (Cl. 128—141)

The invention relates to gas mask equipment. In the use of gas masks in both military and industrial activities, a very common handicap experienced by those under physical stress for considerable periods of time is a fatigue due to the resistance to breathing occasioned by the necessity of drawing air through the chemical components of the canister and the frictional resistance provided by the interior of the corrugated hose. In canisters in which filters are used of such materials, as felt, paper, and the like, this resistance is substantially greater. The object of the present invention is to provide a practical means for augmenting the flow of air through the canister to the mask, so that more air is supplied and the strain of breathing reduced. Briefly stated, this is accomplished by providing a manually operable pumping means in the hose connection between the canister and the mask. This pumping means is of such character that it may be easily and conveniently operated by the wearer of the mask from time to time to meet the demand for additional air, and as opportunity is afforded, depending upon the character of the work in which the operator is engaged. As preferably constructed, the device provides a storage of purified air which is made instantly available when the necessity of an increased supply is experienced by the wearer of the mask, and which may be utilized to clear away the condensed moisture upon the eye pieces of the mask when clouding occurs. In order to accomplish this last function, the air inlets lead to points opposite the eye pieces, as is common in the art. One embodiment of the invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a front view of a mask with the equipment applied thereto with the pumping device in section, and

Fig. 2 is a section on the line II—II of Fig. 1.

Referring to the drawing, 3 is the mask, preferably of molded rubber provided with the straps 4 and eye pieces 5, 5 which may be of any desired construction. The lower wall of the mask is provided with the usual flutter valve 6a to permit of the exhaust of air from the space into which the wearer of the mask exhales. Preferably formed integral with the body of the mask, is an air inlet tube 6 which branches into two parts 7, 7 (Fig. 1), whose upper ends discharge against the lenses of the eye pieces, as indicated in Fig. 2.

Air is conducted to the tube 6 through the hose connections 8, 9, the latter of which is connected to the outlet leading from the canister 10. Such canister has a suitable air inlet, and is provided with the usual filtering means and/or chemical reaction or absorption elements. Located between the hose connections 8, 9 is the pumping device for augmenting the flow of air through the canister and hose connections to the mask. The device comprises a collapsible bulb or tube 11 of rubber or the like connected at its ends to the tubular members 12 and 13 to which the ends of the hose connections are attached. These members are preferably of hard rubber and include the disk portions 14 and 15 which are radially perforated to permit the free passage of air. Secured to the upper faces of the disc members by the bolts 16 and 17 are the discs 18 and 19 of thin flexible sheet rubber which act as check valves permitting a flow of air upward, but preventing any downward flow.

When the tube 11 is collapsed by the hand of the wearer of the equipment, a supply of air is forced upward past the valve 18, the valve 19 preventing any back flow to the canister. When the tube is released, it resumes its original shape, at which time air is drawn upward from the canister past the valve 19, the valve 18 preventing, at such time, any withdrawal of air downward through the connection 8. The tube 11 is located at a point where it may be most easily grasped by the operator, and is of such capacity, that a few quick operations gives the wearer substantial relief in breathing and clears the eye pieces of the mask in case they have become clouded due to condensation. The location of the tube above the canister and just below the mask provides a volume of purified air which is available the instant the pumping tube is collapsed, so that a quick positive supply of air is forced into the mask whenever required.

It will be understood that the flexible pumping chamber may be made in a variety of shapes and forms, and that any suitable form of check valve may be substituted for the flap valves shown. The particular form shown is desirable because of its low resistance to the passage of air, when the pumping chamber is not being operated, and because of its freedom from any tendency to stick in closed position. The passages through the disc portions 14 and 15 are of such aggregated capacity that there is no throttling of the flow of air through the pumping device when such device is not being operated. Although it is preferred to locate the check valves, in the end closure members of the pumping chamber, it is feasible to place them at other points in the hose connections above and below the chamber.

What I claim is:

1. In combination, a gas mask, a canister, an air inlet line from the canister to the mask, a flexible pumping chamber located in the inlet line between the canister and mask, and a pair of check valves at the opposite ends of the pumping chamber, both opening toward the mask.

2. In combination, a gas mask, a canister, an air inlet line from the canister to the mask, a flexible pumping chamber located in the inlet line beween the canister and mask, and a pair of check valves at the opposite ends of the pumping chamber, both opening toward the mask, the air inlet line being arranged to discharge against the eye pieces of the mask.

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